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MR. DeBOTTARI: My name is Lou deBottari. It's spelled out on the paper.

I have reviewed and commented on all the documents DOE has required the public to comment on. I have yet to receive, and I doubt if I ever will receive, any answer of substance.

I have had a concern and expressed it to the DOE on the approach they use to evaluate the impact of radiation releases due to accidents during transportation and while deposited at the Yucca Mountain site.

DOE uses an adult as the model to determine the effects of radiation, plus they derive the damage from victims to the bombs used in Japan. They assume that the damage due to radiation is a linear function over many

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magnitudes and that it can be scaled down to the levels of interest. They also assume that Mother Nature handles radiation effects on the body in a linear fashion.

These are faulty assumptions and I will try to explain why, by using this data -- by using this data, pregnant women and young children are in grave danger.

The element Strontium-90 mimics calcium and

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thus, the body stores this ionization element in the bone marrow. This is not conjecture, as the DOE used this method to determine the amount of Strontium-90 in the environment up until 1982.

This element ionizes the oxygen molecule in the body and converts the oxygen to a free radical. This means that it tries to find cells where it can get another electron and thus, in the process, either destroys developing cells or damages them.

Various investigators have correlated the amount of Strontium-90 in the bones or baby teeth to childhood cancers, breast cancer, infant mortality rates and congenital birth defects. It has also been shown that there is a significant increase in Strontium-90 ingested by a person downwind from a nuclear power plant as compared to a person upwind.

There have been two other data gatherings that indicate birth deaths decreased when a nuclear power plant

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was shut down, either permanently or for a period of about two years. When the plant was restarted, the birth deaths significantly increased.

There is a problem with low emissions from

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nuclear power plants that are impacting our future generations. The Doe has continually told the public that natural radiation is good for us and that the body receives more of a dose from one x-ray than what will be received by a person standing a prescribed distance from one of the casks being transported.

How wrong they are. A study first published in 1972 by a Canadian scientist working for the Canadian Atomic Energy Establishment found that radiation would damage a living cell and that the damage was more severe when the radiation level was very low, 10 millirems and protracted.

This revelation clearly showed that the original DOE premise about being able to scale down a short-range pulse from a bomb to low level continuous radiation was flawed when attempting to predict the damage to the human body.

Further experiments by others showed that a living cell was not damaged by natural radiation. Mother Nature, during evolution of oxygen-breathing mammals, gave the female an enzyme that neutralized the production of

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free radicals while the baby was in the mother and

continued after birth while the cells were being developed.

It was determined that a very small amount above the natural radiation produced by man, damaged evolving cells and thus caused the cancers mentioned earlier.

The DOE had never refuted this information. In fact, the answer was to stop measuring and hope that it would go away.

In a recent response to the NRC concerning the relicensing of nuclear reactors in Florida, the Radiation and Public Project made the following comments:

The damage done, as measured in millirems for low levels of Strontium-90 radioactivity is not only directly proportional to the radioactivity in picoCuries, but also proportional to the energy of the emitted electrons that can travel a few millimeters into tissue. Moreover, it is also directly related to the length of time during which the emission of powerful electrons takes place.

Thus, the biological damage leading to cancer and other diseases is particularly great for Strontium-90, because it has a fairly long physical half-life of 28.7 years and because it also stays in bones for years, as

25 measured by its biological half-life or the time it takes

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1 for half of the Stontium-90 atoms to leave the bone. This
2 biological half-life is about two years for infants and
3 about five to ten years for adolescents and adults. So
4 some Strontium-90 will be found in an individual for many
5 years, even when it is not constantly replaced by new
6 ingestion or inhalation.
7 The dose in millirems produced in bone in the
8 course of a year when the amount of Strontium-90 is kept
9 constant at one picoCurie per gram of calcium has been
10 calculated at 4.5 millirems per year, as given on page 50
11 of the United Nations Scientific Committee.
12 To get a feeling for the importance of a dose of
13 4.5 millirems per year produced by the presence of just
14 one picoCurie of Strontium-90 per gram of calcium in the
15 bone, it is important to realize that the dose due to
16 natural sources of environmental radiation, other than
17 radon in some homes, is about 70 to 100 millirems per
18 year.
19 Since some individuals have been found to have
20 as much as 10 to 15 picoCuries per gram of calcium of
21 Strontium-90 in teeth at birth, the dose per year was more

than ten times the rate of 4.5 millirems per year, or about 45 millirems.

Thus, in the first three or four years of life, at a continuing intake of Strontium-90 from the drinking

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water, the diet and the air, the cumulative dose to bone was in the order of ten -- excuse me -- the range of 100 to 180 millirems. This dose has been compared with the theoretically calculated whole-body dose produced at a maximal-exposed individual by a nuclear reactor, such as one of the subject reactors in 1986, of only .0038 millirems per year, as listed in the 1966 NRC publication.

This is over a thousand times smaller than a yearly dose due to one picoCurie of Strontium-90 per gram of calcium, and over 11,000 times less than the dose of a one-year exposure to 10 pico grams.

The reason for this use discrepancy is that in the calculation of the whole-body dose by the NRC, Strontium-90 is no longer measured in the environmental samples collected around nuclear plants, such as milk, as it used to be required in the 1960s and the 1970s.

The seriousness of this failure to measure Strontium-90 in the environmental samples and thus to

ascertain the actual dose to bone and bone marrows, where the cells of the immune system originate, can be illustrated by the fact that laboratory studies have shown that significant reduction in white cells of the immune system, when measured at doses of the order of only ten millirems by Strontium-90.

By only calculating the total body dose

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theoretically for measurements of the stack releases into the air and not from the actual measurements of environmental samples, only extremely small values were arrived at, such as .0000011 millirems per year due to airborne releases -- over a million times less than the actual requiring Strontium-90 doses based on measured concentrations found in human teeth.

Thus, by no longer Strontium-90 being measured, either in environmental samples or in humans, it has been possible for the NRC to characterize the radiation threat from nuclear power reactors as "microscopic." In this way, the NRC obscures the true danger of the threat to human life and health presented by fission products released into the atmosphere.

These comments are cogent for today's hearing

because it clearly illustrates what I have been concerned about: If we don't measure it, we don't have to comment, and the specifications to protect public health can be based on theory rather than real data.

This is exactly how the Yucca Mountain requirements are being established. The entire project is based on simulations with suspect data. One example is how the impact on public health is being analyzed. The site suitability has not been proven; the barriers are 95 percent engineered and 5 percent natural.

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It has been demonstrated by measurements that we can't build a reactor that has zero leak for 50 years, yet we are being told that the DOE has the capability and credibility to design and construct a system that will allow safe transportation of the high-level nuclear waste with no leakage at any time, and then store it with no leaks for tens of thousands of years.

This had not been demonstrated in any of the documents that DOE has published for the public review. That means it's dangerous -- let's see. Since there's nobody here, that doesn't matter.

It will also be around for as long as

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Strontium-90 is present. That means it will be dangerous in the high-level nuclear waste for a hundred years.

DOE should place the waste in dry storage where it is presently located for the next 100 years, work on a method to guarantee that there will be no low-level emissions -- I mean zero for the life of the reactor. If they can't guarantee no leakage for at least 50 years from a plant before it has to be shut down, how in the world do they expect the public to believe they can create a miracle and design a facility that will not leak for thousands of years?

That's it.

MR. WARD: That completes your comments, sir?

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MR. DeBOTTARI: Yes.